We claim:

1. A spectral shaping device comprising:

an optical waveguide having a guiding channel surrounded by a transmissive media for guiding light energy in a guided mode;

a plurality of grating sections formed in the guiding channel of the waveguide, each grating section separated by an interval less than 10 periods in length, at least one of the intervals having been exposed to ultraviolet light after the plurality of gratings have been formed in the guiding channel to adjust the index of refraction of the interval.

2. The spectral shaping device of claim 1, wherein each grating section has the same spatial period.

3. The spectral shaping device of claim 1, wherein the optical waveguide is an optical fiber, the guiding channel is a core portion of the optical fiber, and the transmissive media surrounding the core portion is a cladding layer.

4. The spectral shaping device of claim 3, wherein the guided mode includes a guided mode transmitted in the core of the optical fiber and a guided mode transmitted in the cladding layer, and wherein the plurality of grating sections couple light energy between the guided mode transmitted in the core and the guided mode transmitted in the cladding layer.

5. The spectral shaping device of claim 4, wherein the core of the optical fiber transmits only a single guided mode over a selected wavelength range.

6. The spectral shaping device of claim 1, wherein each grating section has a peak index change, and the peak index change of each grating section is approximately equal.

7. A coupler for coupling co-propagating guided modes of an optical waveguide, comprising:

an optical waveguide having a guiding channel surrounded by a transmissive media for guiding light energy in a guided mode;

a plurality of grating sections formed in the guiding channel of the waveguide, each grating section separated by an interval, at least one of the intervals having been exposed to ultraviolet light to adjust the index of refraction of the interval.

8. The coupler of claim 7, wherein each grating section has the same spatial period.

9. The coupler of claim 7, wherein the interval separating each grating section is less than 10 periods in length.

10. The coupler of claim 7, wherein the waveguide is an optical fiber having a core portion and a cladding layer.

11. The coupler of claim 10, wherein the grating sections couple light between guided modes in the core and cladding layer.

12. A method of forming a gain flattening filter in an optical fiber, comprising:

providing an optical fiber having a photosensitive core;

providing a target spectrum to be matched by the gain flattening filter;

determining the parameters of the gain flattening filter necessary to provide a spectrum to match the target spectrum;

forming a plurality of grating sections in the photosensitive core of the optical fiber in accordance with the determined parameters, each grating section have the same spatial period, and each grating section being separated from an adjacent grating section by an interval having a length of less than ten spatial periods.

13. The method of claim 12, further comprising analyzing the spectrum to determine if it matches the target spectrum within a selected range, and, if the spectrum does not match the target spectrum with the selected range, determining at least one interval to be illuminated with ultraviolet light to alter an optical length of the determined at least one interval, and exposing the determined at least one interval to ultraviolet light to alter the optical length of the at least one interval.

14. The method of claim 13, wherein exposing the determined at least one interval to ultraviolet light alters the optical length of the determined at least one interval by altering the refractive index of the core of the optical fiber in the area of the determined at least one interval.

15. The method of claim 13, further comprising monitoring the spectrum during exposing the determined at least one interval to ultraviolet light.

16. A method of forming a gain flattening filter capable of coupling light energy between co-propagating modes of transmitted light in an optical fiber, comprising:

providing an optical fiber having a photosensitive core;

providing a target spectrum to be matched by the gain flattening filter;

determining the parameters of the gain flattening filter necessary to provide a spectrum to match the target spectrum;

forming a plurality of gratings in the photosensitive core of the optical fiber in accordance with the determined parameters and each grating separated from an adjacent grating by an interval having a length of less than ten periods;

analyzing the spectrum of the filter after forming the plurality of gratings to determine whether the spectrum of the filter matches the target spectrum within a selected range;

determining, if the spectrum of the filter does not match the target spectrum within a selected range, at least one parameter to be used in adjusting the optical length of at least one of the intervals to fine tune the spectrum; and

illuminating the at least one interval with ultraviolet light in accordance with the determined at least one parameter to alter the optical length of the at least one interval.

17. The method of claim 16, further comprising monitoring the adjusted spectrum of the filter while exposing the at least one interval to determine if the adjusted spectrum matches the target spectrum within the selected range.

18. A spectral shaping device, comprising:

means for guiding light energy in a guided mode having a guiding channel surrounded by a transmissive media;

a plurality of means for coupling selected wavelengths of the light energy into a co-propagating mode in the transmissive media, each means for coupling separated from an adjacent means for coupling by an interval.

19. The spectral shaping device of claim 18, wherein at least one of the intervals separating adjacent means for coupling having been exposed to index altering means to change a characteristic of the interval.

20. The spectral shaping device of claim 18, wherein the means for guiding is an optical fiber having a core and a cladding layer.